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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,466	06/22/2006	Klaus Bohmhammel	292190US0PCT	3331

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

NGUYEN, COLETTE B

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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04/29/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/584,466	Applicant(s) BOHMHAMMEL ET AL.	
	Examiner COLETTE NGUYEN	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the application.

RCE filed on 02/22/10

Claim 1 is amended. Claims 2 to 4 are cancelled.

Claims 1, 5-10 are presented for examination

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/22/10 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 1793

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roewer et al. (US5,716,590), in view of Corbin et al.(US5,600,040).

5. Regarding claim 1. Roewer(590) discloses a process for catalytic hydrodehalogenation of a halogen-containing compound of carbon or silicon such as silicon tetrachloride to trichlorosilane in the presence of hydrogen with a catalyst system comprising of silicon and at least one transition metal or salt of the metal (col 4, line 65) at a temperature sufficient to induce catalytic hydrodehalogenation in a range of 300 to 1000C (col1, line 45-60 and col4, line 40).The active system comprises ceramic carriers or supports such as SiO₂, zeolites (Col5, line 22, 35). The process has application in refrigerant recycling and synthesis of hydrocarbons or halogenated hydrocarbons. He does not disclose a catalyst system comprising elements of group 2 of the periodic

Art Unit: 1793

table. Corbin et al. (040) discloses a purification process of refrigerant by using sorbents such as carbons and zeolites with alkaline earth metals selected from the group consisting of calcium, strontium, barium and combinations thereof.(Corbin, Col.3, ln 47-52) to separate HFC-134 isomers (HFC-134 or HFC-134a by hydrodehalogenation), a refrigeration fluid. The activated carbon, a supported catalyst, has a total content of 0.1 - 10 wt% of alkali and alkaline earth metals (Corbin, col.3, ln47-52). The subject matter as a whole would have been obvious for one of ordinary skill in the art at the time of the invention to replace the transition metal of Roewer with the teaching of Corbin of a catalyst with alkaline earth metal such as Barium, Strontium, Magnesium, Calcium (the elements of the Group II in the periodic table) which shows better selectivity and conversion therefore quality improvement in purification can be achieved as both teaches hydrodehalogenation process to purify and recycle halogenated hydrocarbon such as refrigerant.

6. Regarding claim 5. Corbin discloses supported catalyst content, calculated as element of 0.1 to 10% by weight (Col3, ln 46, “typically *the activated carbon used will have a total content of from about 0.1 to 10 weight percent of alkali and alkaline earth metals*”).

7. Regarding claim 6.Roewer teaches a 1 to 20 molecules of H₂ are used per halogen atom.

8. Regarding claim 7. Corbin discloses the reaction can be carried out in a fixed – bed reactor, a fluidized-reactor or a moving-bed reactor. (Corbin, Col 5, ln. 28-35).

9. Regarding claim 8. Roewer in view of Corbin disclose a process as claimed in claim 1 wherein the catalytic reaction is carried out at a temperature in the range from

Art Unit: 1793

300-1000C and at 1 atm or 0.98 bar (Roewer, Col 2, ln 57-62, and Col 3, ln 46-58) and - 20 to 300C and 10 to 3000 kPa or 30 bars (Corbin, col 2, ln 10). Pressure and temperature are effective variables which can be optimized and the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of the invention to select the portion of the prior art range which is within the range of the applicant claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. In *re Boesch*, 205 USPQ 215, in *re Malagari*, 182 USPQ 549. It would have been obvious to one of ordinary skill in the art to optimize these conditions through routine experimentation in order to obtain the best results.

10. Regarding claim 9. Roewer in view of Corbin disclose a process as claim 1 wherein Roewer discloses that “ *the optimum temperature thereby naturally varies for individual compounds, and also depends on process parameters, e.g. on the space velocity with respect to the catalyst*” (Col 3, ln 47-52) and the optimum process parameters can be determined by small-scale tests such as temperature and space velocity (Col 3 line 554-56). Despite that space velocity is not disclosed, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See in *re Boesch*, 205 USPQ 215. And with known temperature and pressure ranges, velocity can be determined with optimization and experimentations.

11. Regarding claim 10. Roewer in view of Corbin disclose a process as claim 1 wherein trichlorosilane is isolated from the product mixture.

Response to Arguments

12. Applicant's arguments filed 01/21/2010 have been fully considered but they are not persuasive. As mentioned above, Roewer teaches a catalytic hydrodehalogenation process of halogen-containing compounds of element of the fourth group of the periodic table, in particular carbon and silicon such as silicon tetrachloride (Col 4, line 45) to make trichlorosilan (HSiCl_3) in the presence of hydrogen and a supported catalyst at a temperature range of 300-1000°C. The catalyst uses transition metal or its metal salts. The process is used for hydrodehalogenation of refrigerant R113 as one of the many applications. Corbin teaches a process to purify/ to recycle refrigerant such as HFC-134a by using a sorbent of activated carbons containing alkali and/or alkaline earth metals (Col 3, line 55-60) and inorganic molecular sieves such as zeolites. The sorbent of Corbin has the same function as a catalyst in fluidized bed or reactors therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to replace the transition metal of Roewer with the alkali metals of Corbin to solve the problem of silicides formation. As both teach a process to purify and recycle halogenated hydrocarbon such as refrigerants, it would be obvious for one of ordinary skill in the art to improve Roewer's process further with different alternatives such as the teaching of Corbin of a supported catalyst with alkali metal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David M Brunsman/
Primary Examiner, Art Unit 1793

/COLETTE NGUYEN/
Examiner, Art Unit 1793